

REMARKS

Applicants amend claims 1, 7 and 12. No new matter is added. Support for the amendment can be found throughout the specification and at least at Figs. 3, 17, 20 and related text. Upon entry of this amendment, claims 1-9 and 12-13 are presented for examination, of which claims 1 and 7 are independent. Applicants respectfully submit that claims 1-9 and 12-13 define over the art of record.

I Information Disclosure Statement

Applicants submit an Information Disclosure Statement (IDS) herewith.

II. Telephone Interview with the Examiner

Applicants thank the Examiner for the telephone interview conducted with the Examiner on December 14, 2007. In light of the interview, Applicants amend claims 1, 7 and 12. Claim 12 now depends from claim 1. During the interview, the Examiner indicated that the amendments to claims 1 and 7 are likely to overcome the rejections.

Regarding claim 1, the Examiner agreed that amending claim 1 to recite that the first electrically conductive film and the second electrically conductive film are separate and distinct from the first and second electrodes, and that an expansion portion is made of the same material as the first or second electrically conductive films, is likely to address the rejection. The Examiner indicated that claim 1 needs to be amended to better describe the structure of the expansion. Applicants further amend claim 1 to recite that *the expansion is provided between the first electrically conductive film and the second electrically conductive film.*

Regarding claim 7, the Examiner indicated that the seal gaskets 20 and 21 of the U.S. Patent Application Publication No. 2003/0104262 to Kuroki et al. (hereafter "Kuroki"), formed by being impregnated with a liquid silicon rubber, seem to be electrically insulating. As such, the Examiner said that amending claim 7 to recite that *the first and second reinforcing films are electrically conductive* is likely to address the rejection of claim 7.

Regarding claim 12, the Examiner explained that he construes the coolant passage (226) of U.S. Patent Application Publication No. 2002/0187382 to Nishiumi et al. (hereafter

“Nishiumi”) as equivalent to the plurality of guide grooves of claim 12. *See Figure 5 of the Nishiumi reference.* The Examiner also construes the annular space (27) of the Richards reference as equivalent to a coolant passage formed in a spacing between the casing and the fuel cells. *See Figure 8 of the Richards reference.* In response, Applicants amend claim 12 to depend from independent claim 1.

During the interview, the Examiner also acknowledged that the Japanese Patent Application Publication No. JP 2003-197225 to Maeda et al. (hereafter “Maeda”) does not qualify as prior art because of the earlier priority date of the present application.

III. Rejection of Claims under 35 U.S.C. § 103

A. Claims 1-6

Claims 1 and 2 are rejected under 35 U.S.C. §103(a) as being unpatentable over United State Patent Application Publication No. 2001/0044041 to Badding et al. (hereafter “Badding”) in view of United States Patent No. 4,666,798 to Herceg (hereafter “Herceg”) and further in view of United States Patent No. 6,680,139 to Narayanan et al. (hereafter “Narayanan”).

Claims 3 and 4 are rejected under 35 U.S.C. §103(a) as being unpatentable over the Badding reference in view of the Herceg and Narayanan references, and further in view of United States Patent No. 3,770,509 to Winsel et al. (hereafter “Winsel”).

Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over the Badding reference in view of the Herceg and Narayanan references, and further in view of the Maeda reference.

Claim 6 is rejected under 35 U.S.C. §103(a) as being unpatentable over the Badding reference in view of the Herceg and Narayanan references, and further in view of the Nishiumi reference.

Applicants respectfully submit that any combination of the Badding reference, the Herceg reference, the Narayanan reference, the Winsel reference, the Maeda reference and the Nishiumi reference do not teach or suggest a first electrically conductive film and a second electrically conductive film, *separate and distinct from* the first and second electrodes, as recited

in amended claim 1. Furthermore, the references do not teach or suggest *an expansion portion that is made of the same material as the first or second electrically conductive films*, as recited in amended claim 1.

The Badding Reference

The Badding reference teaches electrode/electrolyte structure for use in a fuel cell. Electrical contact with the electrodes is made through rows of interconnects (14) along the lower edges of each electrode. *See [0029].* The interconnects (14) traverse the electrolyte sheet (10) through openings (14a) in the sheet. The interconnects (14) electrically connect the electrochemical cells formed by the cathode segments (12) on the top of the sheet (10) and anode segments (16) on the bottom of the sheet (10) into a series-connected cell array. *See [0030].*

However, the Badding reference does not teach or suggest a first electrically conductive film and a second electrically conductive film, *separate and distinct from* the first and second electrodes, as recited in amended claim 1. Furthermore, the Badding reference does not teach or suggest *an expansion between the adjacent power generation units for connecting the first electrically conducting film and the second electrically conducting film*, wherein a portion of each electrolyte of the pair of adjacent power generation units is sandwiched between the first and second electrically conductive films, as recited in amended claim 1.

The Herceg Reference

The Herceg reference is cited by the Examiner to show that the adjacent fuel cell segments (26) of the Herceg reference are electrically connected by a first electrically conductive layer (38), a second electrically conductive layer (39) and an interconnect (41). However, the parts of the Herceg reference identified by the Examiner as the first electrically conductive layer (38) and the second electrically conductive layer (39) are the anode and the cathode, respectively. As such, the Herceg reference, like the Badding reference, does not teach or suggest a first electrically conductive film and a second electrically conductive film, *separate and distinct from* the first and second electrodes, as recited in amended claim 1.

Furthermore, in the Herceg reference, the interconnect (41) is made from a separate material than the material of the anode (38) and the cathode (39). The Herceg reference indicates that the anode material and the cathode material are porous to the degree required to

allow the fuel and oxidant gases confined on the opposite sides of the electrolyte (40). The interconnect (41) and the electrolyte (40) are impervious and serve to isolate the fuel oxidant gases completely from one another.

The Narayanan Reference

The Narayanan reference is cited by the Examiner to show that membrane electrode assemblies 97 (the alleged power generation units) are placed on top of a wicking structure 120 (the alleged porous insulating film). Without characterizing the Examiner's analysis of the Narayanan reference, the Narayanan reference, like the Badding and Herceg references, does not teach or suggest a first electrically conductive film and a second electrically conductive film, *separate and distinct from* the first and second electrodes, as recited in amended claim 1. Furthermore, the Badding, Herceg and Narayanan references do not teach or suggest an expansion portion that is made of the same material as the first or second electrically conductive films, as recited in amended claim 1.

The Winsel Reference

The Winsel reference is cited by the Examiner to show that the electrical conductive film can be made of composite materials including resin and an electrically conductive material, as recited in claims 3 and 4. The Winsel reference teaches a multilayered gas diffusion unitary electrode body. *See Abstract.* However, like the Badding, Herceg and Narayanan references, the Winsel reference does not teach or suggest a first electrically conductive film and a second electrically conductive film, *separate and distinct from* the first and second electrodes, as recited in amended claim 1. Furthermore, the Badding, Herceg, Narayanan and Winsel references do not teach or suggest an expansion portion that is made of the same material as the first or second electrically conductive films, as recited in amended claim 1.

The Maeda Reference

The Maeda reference has a publication date of July 11, 2003, which is after the earliest priority date March 7, 2003 of the present application. The Maeda reference is disqualified as a prior art reference in view of the certified English translation of the priority documents submitted on July 13, 2007. We believe that the Examiner overlooked the argument presented on page 9 of the previous Response submitted on July 13, 2007.

The Nishiumi Reference

The Nishiumi reference is cited by the Examiner regarding to claim 6 to show that a reactant gas supply passage 228 and a reactant gas discharge passage 229 extend through an end of the fuel cell at Fig. 4 and Paragraph 48. Without characterizing Examiner's analysis of the Nishiumi reference, like the Badding, Herceg and Narayanan references, the Nishiumi reference does not teach or suggest a first electrically conductive film and a second electrically conductive film, *separate and distinct from* the first and second electrodes, as recited in amended claim 1. Furthermore, the Badding, Herceg, Narayanan and Nishiumi references do not teach or suggest *an expansion portion that is made of the same material as the first or second electrically conductive films*, as recited in amended claim 1.

Claims 2-6 depend from claim 1 and, as such, incorporate each and every element of claim 1. In light of the arguments presented above, Applicants respectfully submit that claims 1-6 define over the art of record.

B. Claims 7-9

Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over the Narayanan reference in view of United State Patent Application Publication No. 2003/0104262 to Kuroki et al. (hereafter "Kuroki").

Claim 8 is rejected under 35 U.S.C. §103(a) as being unpatentable over the Narayanan reference in view of the Kuroki reference, and further in view of United States Patent Application Publication No. 2003/0113609 to Batfalsky et al. (hereafter "Batfalsky").

Claim 9 is rejected under 35 U.S.C. §103(a) as being unpatentable over the Narayanan reference in view of the Kuroki reference, and further in view of United States Patent No. 5,942,348 to Jansing et al. (hereafter "Jansing").

Applicants respectfully submit that the combination of the Narayanan reference and the Kuroki reference does not teach or suggest the first and second reinforcing films are *electrically conductive*, as recited in amended claim 7.

The Narayanan Reference

The Narayanan reference teaches membrane electrode assemblies 97, 98, 99 that are spread out and aligned in a horizontal plane and positioned on top of a wicking structure 120. The Examiner notes that the Narayanan reference does not teach or suggest first and second reinforcing films, as required by claim 7. The Examiner looks to the Kuroki reference to cure the deficiency of the Narayanan reference.

The Kuroki Reference

The Kuroki reference teaches the stacking of unit cells to from a fuel battery in Fig. 15. The Examiner alleges that the seal gaskets 20 and 21 in Fig. 8 are the equivalent of first and second reinforcing films. However, the seal gaskets 20 and 21 of the Kuroki reference are formed by being impregnated with a liquid silicone rubber. *See [146].* Applicants respectfully submit that the rubber material is electrically insulating. As such, the Kuroki reference, combined with the Narayanan reference, does not teach or suggest that the first and second reinforcing films are *electrically conductive*, as required by amended claim 7. Furthermore, the Kuroki and Narayanan references do not teach or suggest that the second end of second electrically conductive gas diffusion layer of the second electrode of the second power generation unit *protrudes toward the first power generation unit*, as required by claim 7. Figures 8 and 9 of the Kuroki reference illustrate a single power generation unit. The corresponding text to Figures 8 and 9 of the Kuroki reference states that the figures show a cross section of a fuel battery. However, the text is silent about a first and second power generation units, where the second end of second electrically conductive gas diffusion layer of the second electrode of the second power generation unit *protrudes toward the first power generation unit*.

The Batfalsky Reference

The Batfalsky reference teaches an interconnector plate 2 with openings and contact elements 3 that electrically contact the electrodes 5 and 7. See Abstract. An elastic silver mesh 6 contacts the anode 5 and the silver set heads 3. An elastic silver mesh 8 contacts the cathode 7 and the silver set heads 3. However, the elastic metal mesh of the Batfalsky reference are not equivalent of the first and second reinforcing films of claim 7 since the elastic metal mesh of Batfalsky is provided between the electrode and the contact element and does not contact the electrode. Combining the Batfalsky reference with the Narayanan and the Kuroki references

will add an additional elastic metal mesh layer between the gas diffusion layer 15 and the separator 17 of the Kuroki reference. As such, the combination of the Narayanan, Kuroki and Batfalsky references do not teach or suggest a first and second *electrically conductive* reinforcing films that are in physical contact with the electrolyte. Furthermore, the combination of the Narayanan, Kuroki and Batfalsky references do not teach or suggest that the second end of second electrically conductive gas diffusion layer of the second electrode of the second power generation unit *protrudes toward the first power generation unit*, as required by claim 7.

The Jansing Reference

The Jansing reference is cited by the Examiner regarding claim 9 to show that a first electrically insulating bipolar plate 30 and a second electrically insulating bipolar plate 30' sandwich a membrane electrode assembly 43. *See Page 10 of the Office Action.* Without characterizing the Examiner's analysis of the Office Action, the Jansing reference, like the Narayanan reference, does not teach or suggest a first and second *electrically conductive* reinforcing films that are in physical contact with the electrolyte. Furthermore, the combination of the Narayanan, Kuroki, Batfalsky and Jansing references do not teach or suggest that the second end of second electrically conductive gas diffusion layer of the second electrode of the second power generation unit *protrudes toward the first power generation unit*, as required by claim 7.

Claims 8-9 depend from claim 7 and, as such, incorporate each and every element of claim 7. In light of the arguments presented above, Applicants respectfully submit that claims 7-9 define over the art of record.

C. Claims 12-13

Claim 12 is rejected under 35 U.S.C. §103(a) as being unpatentable over the Badding reference in view of the Jansing reference, the Nishiumi reference, and further in view of United States Patent No. 5,547,777 to Richards (hereafter "Richards").

Claim 13 is rejected under 35 U.S.C. §103(a) as being unpatentable over the Badding reference in view of the Jansing reference, the Nishiumi reference, the Richards reference, and further in view of Japanese Patent Application Publication No. 63-279578 to Ide et al. (hereafter "Ide").

Claim 13 depends from claim 12. Claim 12 is amended to depend from claim 1. As such, claims 12 and 13 depend from claim 1 and incorporate each and every element of claim 1. Claims 12 and 13 are patentable for the reasons as set forth above regarding claim 1.

CONCLUSION

Please charge any shortage or credit any overpayment of fees to our Deposit Account No. 12-0080, under Order No. TOW-066RCE. In the event that a petition for an extension of time is required to be submitted herewith, and the requisite petition does not accompany this response, the undersigned hereby petitions under 37 C.F.R. § 1.136(a) for an extension of time for as many months as are required to render this submission timely. Any fee due is authorized to be charged to the aforementioned Deposit Account.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Dated: January 10, 2008

Respectfully submitted,

By


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